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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,370	12/06/2001	Lars Erik Eskildsen	PH01-01-08	4362

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EXAMINER

CALEY, MICHAEL H

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/008,370	ESKILDSEN ET AL.	
	Examiner	Art Unit	
	Michael H. Caley	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 5-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wong (U.S. Patent No. 5,285,516).

Regarding claim 1, Wong discloses a method of fabricating an optical attenuator comprising the steps of:

- a. arranging a first end face of a first optical fiber and a second end face of a second optical fiber so that they face one another in close proximity (Column 3 lines 18-19);
- b. laterally offsetting from one another the first and second end faces of the optical fibers (Column 3 lines 25-28);
- c. fusing the first end face of the first fiber to the second end face of the second fiber to create a fusion splice (Column 3 lines 30-43);
- d. measuring attenuation imposed on an optical signal transmitted from the first to the second optical fiber and through the fusion splice to determine an initial deviation in attenuation from a prescribed value (Column 3 lines 44-45);
- e. re-fusing the fusion splice while exerting an axially directed force on the first and second end faces of the optical fiber (Column 3 lines 50-55);

- f. repeating step (d) to determine a subsequent deviation in attenuation from the prescribed value (Column 3 lines 55-57);
- g. repeating step (e) to reduce the subsequent deviation in attenuation (Column 3 lines 55-57);
- h. if necessary, repeating steps (f) and (g) until a resulting deviation in attenuation falls within a prescribed tolerance (Column 3 lines 55-57).

Regarding claim 2, Wong discloses the method wherein the initial deviation results in an attenuation that is less than the prescribed value and the axially directed force compresses the first and second ends of the fibers (Column 3 lines 50-57).

Regarding claim 5, Wong discloses the method in which the step of creating a fusion splice is performed by an electric discharge fusion splicer (Column 2 lines 40-42).

Regarding claim 6, Wong discloses the method in which the first and second fibers are single mode fibers (Column 2 lines 20-21).

Regarding claim 7, Wong discloses the method in which the first and second fibers are multimode fibers (Column 2 lines 20-21).

Regarding claims 8 and 9, Wong discloses a fusion splice optical attenuator in accordance with the proposed method (Column 1 lines 39-42).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Gleason et al. (U.S. Patent No. 4,557,557 "Gleason").

Wong discloses all of the proposed limitations except for the method in which the initial deviation results in an attenuation that is greater than the prescribed value and the axially directed force pulls the first and second ends of the fibers apart from one another. Wong discloses the method of applying power to the junction in order to reduce attenuation to a prescribed value. Such a method would inherently provide an axially directed force pulling apart the fused first and second ends of the fibers. This force is manifested in that allowing the fibers to heat excessively would create a complete separation between the joined fibers (Wong; Column 3 lines 35-38). Gleason teaches the method of creating an attenuator by compressing the abutted ends of two fibers to create a deformed lumped optical loss in the molten ends of the fibers (Gleason; Column 3 lines 2-5) while monitoring the optical loss continuously.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied an axially directed force pulling the first and second ends of the fibers apart from one another. Wong discloses as an optimal method of iteratively fusing the fiber attenuator in which the coupled region is allowed to cool before taking an attenuation measurement, which allows for the most accurate measurement given that the surface tension effects from cooling and other transient effects are allowed to occur. In the method disclosed by Gleason, the measurements are taken before the effects of surface tension are allowed to occur (while the coupled region is still hot), which results in an inaccurate assessment of the final attenuation of the coupler. One would have been motivated to use the method disclosed by

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Wong in constructing an optical fiber as taught by Gleason in order to achieve the most precise coupling possible. However, unlike the method disclosed by Gleason, such a technique could allow the builder to overshoot the desired attenuation, necessitating the fibers to be pulled apart to reverse the attenuating effect of compressing the fibers. Such a method would have been apparent to one of ordinary skill in the art in light of the iterative heating methodology disclosed by Wong.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Sahinci et al. (U.S. Patent No. 6,478,482 "Sahinci").

Wong discloses all of the proposed limitations except for the prescribed tolerance as less than or equal to ± 0.05 dB. Sahinci teaches an attenuation splicing method and system realizing an accuracy within ± 0.1 dB or better by means of advanced heating control techniques (Column 9 lines 55-61). Sahinci also teaches a preference of axially misaligned fibers over overlapped fiber splicing methodologies (Column 5 lines 20-23).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have developed a methodology as proposed in which the prescribed tolerance is less than or equal to ± 0.05 dB. Wong discloses an iterative methodology of achieving a desired attenuation in an optical fiber splice by means of heating and applying axial pressure to the bond. Sahinci proposes various improvements to the method taught by Wong, such as using a nonoverlapping technique and an improved heating control of the fibers. By applying such improvements to the iterative method as disclosed by Wong, one of ordinary skill in the art could have realized accuracies surpassing the values disclosed by Sahinci. Additionally, the prescribed

tolerance may be achieved more easily for specified low amounts of attenuation and by throwing out splices which do not meet the specification.

Response to Arguments

Applicant's arguments filed 8/25/2003 have been fully considered but they are not persuasive.

Applicant asserts that Wong fails to disclose the steps of arranging a first end face of a first optical fiber and a second end face of a second optical fiber so that they face one another in close proximity and fusing the first end face of the first fiber to the second end face of the second fiber to create a fusion splice. As stated above and in the previous action, Wong discloses the step of arranging a first end face of a first optical fiber and a second end face of a second optical fiber so that they face one another in close proximity (Column 3 lines 18 and 19). Wong discloses the initial alignment in Figures 1 and 2 (Column 3 line 8) and that the fibers are moved from an initial position to a position in which the fibers are "coaxial and almost touching". This arrangement prior to fusion meets the limitation of the first and second end faces facing one another in close proximity.

Secondly, the Examiner acknowledges that Wong discloses the fibers as overlapping one another prior to fusing. The limitation "fusing the first end face of the first fiber to the second end face of the second fiber to create a fusion splice", however, is insufficient to overcome the method disclosed by Wong. Wong discloses a method of fusion splicing one entire end of a first fiber to a second entire end of a second fiber (Figures 3-4C), including the end faces. This fusion

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splice includes fusing the first end face of the first fiber to the second end face of the second fiber in order to create a fusion splice.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Zheng et al. (U.S. Patent No. 5,897,803 "Zheng").

Lastly, the Examiner acknowledges a difference between the method disclosed by Applicant and the method disclosed by Wong in that the first and second end faces fail to be facing one another at the instance of fusion, *however this limitation is not present in claim 1*. Such methods of creating a fusion splice are common as taught by formerly cited Zheng.

In such a case, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have had the first and second end faces facing one another at the point in time of fusion. One would have been motivated to use such a method in order to benefit from the taught advantages such as an improved repeatability in manufacture and a shortened heating period (abstract, Column 2 line 62 to Column 3 line 5). Such a method of creating an attenuator through a fusion splice with facing ends is considered to be old and well known and in combination with the method disclosed by Wong, there appears to be no novel or non-obvious feature of the presented fusion splicing method.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (703) 305-7913. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


mhc


T. Chowdhury
Primary Examiner